DOCUMENT RESUME

ED 166 735 CS 502 285

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TITLE A Multivariate Study of Demographics, Psychological Sex-Roles and Communication Apprehensions.
PUB DATE Nov 78
NOTE 38p.; Paper presented at the Annual Meeting of the Speech Communication Association (64th, Minneapolis, Minnesota, November 2-5, 1978) ; Best copy available

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS Androgyny; *Communication (Thought Transfer); *Demography; Higher Education; Identification (Psychological); Interpersonal Competence; *Psychological Patterns; Research; Secondary Education; Self Concept; Sex (Characteristics); *Sex Differences; *Sex Role; Social Psychology
IDENTIFIERS *Communication Apprehension; *Communication Research

ABSTRACT

A multivariate study focused on external relationships between (a) demographic variables and (b) psychological sex roles and communication apprehension variables. It also investigated differences among psychological sex types and biological sex types with respect to social desirability, speech apprehension, and listening apprehension at the junior high, senior high, college, and composite levels. The subjects for the study were 157 junior high students, 154 senior high students, and 181 college students. Each subject completed a four-part questionnaire consisting of a sex-role inventory, a communication apprehension measure, a receiver apprehension test, and a section requesting demographic information. Correlational analyses revealed that older subjects had higher masculine and feminine scores. Other results indicated that significant differences existed among psychological sex types at each educational level on dependent measures. Biological sex results did not support previous literature. The findings also revealed that college students were five times more likely to be androgynous than junior high students and two times more likely than senior high students. Junior high students, however, held a 4 to 1 ratio over college students and a 2 to 1 ratio over senior high students in the undifferentiated category. (Fourteen tables of data are appended.) (Author/FL)

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INSTRUCTIONAL DEVELOPMENT DIVISION

A MULTIVARIATE STUDY OF DEMOGRAPHICS, PSYCHOLOGICAL SEX-ROLES AND COMMUNICATION APPREHENSIONS

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A MULTIVARIATE STUDY OF DEMOGRAPHICS, PSYCHOLOGICAL SEX-ROLES AND COMMUNICATION APPREHENSIONS

ABSTRACT

This multivariate investigation focuses on (1) external relationships between (a) demographic variables and (b) psychological sex-roles and communication apprehension variables, (2) differences among psychological sex types on social desirability--speech apprehension, and listening apprehension at the junior high, senior high, college, and composite levels, and (3) differences between biological sex types on social desirability, speech apprehension and listening apprehension. The correlational analyses revealed that older participants had higher masculine and feminine scores. Other results indicated that significant differences exist among psychological sex types at each educational level and composite level on dependent measures. Biological sex results did not support previous literature. The results also revealed that college students are five times more likely to be androgynous than junior high students and two times more likely than senior high students. Junior high students, on the other hand, held a 4 to 1 ratio over college students and a 2 to 1 over senior high students in the undifferentiated category. The researchers relate these results to Piaget's theory of formal operations.

A Multivariate Study of Demographics, Psychological Sex Roles, and Communication Apprehension

Introduction

Traditional sex role stereotypes indicate that males are aggressive, dominant, independent, unemotional, and task-oriented, whereas females are passive, submissive, need security, express tender feelings, and are person-oriented.[1] In 1943 Strong pointed out that traditional sex roles exist from the adolescent years to middle age.[2] More recently, Block suggested that parents of boys were more interested in the task-oriented achievements of their sons, whereas parents of girls were more interested in the interpersonal trust of their daughters.[3] This study cross-validated the findings of Carlson's study in which the self-images of men were represented in impersonal, individualistic terms while the self-images of women were represented in interpersonal terms.[4]

In earlier research Bennet and Cohen reported overlap in the self-concepts of male and female college students which suggested that sex-role stereotypes may not have a major influence in the individuals' self-concepts.[5] Rosenkrantz, et al., however, concluded that male stereotypic traits included aggressiveness, independence, logic, adventurousness, self-confidence, and unemotionalism. Female stereotypic traits, on the other hand, include a strong need for security, expression of tender feelings, awareness of feelings of others, tactfulness, and gentleness. The results of their study supported the following assertions: (1) both college males and females clearly defined and held sex role stereotypes, (2) females held negative values of their worth in relation to the worth of males, and (3) a greater number of the characteristics and behaviors stereotypically associated with the males were more socially desirable than those associated with the female.[6]

Although an abundance of experimental and survey research has been completed on sex roles during the past forty years, social scientists have developed a renewed interest in the topic. In 1971 Bem[7] challenged whether gender appropriate sex roles enhance psychological and social adjustment. Based on a review of sex role literature, she indicated that most past investigations have concluded that males are task-oriented and females are social-oriented or that "mature women equals immature adults." Her search revealed that certain research supports her basic contention. Studies of femininity consistently reveal that sex-typing is related to poorer adjustment in girls and women.[8] Studies by Mussen[9] and Harford[10] also found that high masculinity led to poorer adjustment in adult men. Mussin's study further indicates high masculinity to be beneficial to adolescent males but becomes a hardship in adult years.

Bem[11] also challenged the reliability and validity of past sex role inventory instruments. She theorized that masculinity and femininity are independent dimensions rather than opposite ends of a single dimension (a bipolar, unidimensional concept), that both dimensions (male and female) are characterized by their own unique set of positively valued attributes, and, finally, that masculinity and femininity are measured by using separate scales which are logically and empirically independent.

In order to test the psychological sex role theory, Bem developed the Bem Sex Role Inventory (BSRI).[12] The instrument consists of three dimensions: masculinity, femininity, and social desirability. Participants who are a blend of male and female characteristics are termed androgynous. Androgyny literally means man-woman and is taken from the Greek words "andro" meaning male and "gyn" meaning female.

Since the development of BSRI, several investigations have been completed to test the androgynous construct. Bem hypothesized that sex-typed individuals will be consistent across a variety of situations to maintain an internalized sex-type image. Androgynous people, on the other hand, will be inconsistent, varying behavior based on the situation and perceiving freedom as the hallmark of mental health. In five studies completed by Bem, androgynous men and women behaved similarly in the same situation while sex-typed of sex-reversed peers displayed traditional sex-role stereotypes.[13]

Other research using the BSRI also revealed androgynous individuals behaved differently than other psychological sex-types. The Eman and Morse study confirmed that androgynous individuals expressed higher degrees of self-esteem, self-acceptance and acceptance of others than groups of masculine, feminine of undifferentiated identified individuals.[14] Greenblatt, Hasenauer and Freimuth's study revealed psychological sex-type is a more precise predictor than biological sex.[15] That is, psychologically feminine and androgynous individuals disclose more information about themselves and are psychologically more healthy than masculine of undifferentiated individuals. In addition, the study revealed that androgynous subjects experience less speech apprehension than traditionally sex-typed people. Montgomery and Burgoon's study also supported Bem's theory.[16] In all of the above studies psychological sex was a better predictor than biological sex. By using psychological sex as an independent variable, within group variance is decreased and between group variance is increased. This will increase the reliability and validity of sex-role research.

This exploratory study will replicate and extend the research of Greenblatt, et al.[17] Like their study, speech communication apprehension will be used as a dependent measure. Unlike their study, social desirability, listening apprehension and demographic variables will be used to determine differences

based on psychological sex-type. This multivariate study will attempt to determine (1) relationships between demographic variables, psychological test variables and apprehension variables and (2) differences among and across educational levels on psychological sex scores and apprehension scores.

This study is justified as previous research, including Bem's, have ignored, for the most part, social desirability as an independent variable. Based on Bem's theory, social desirability should not be a salient variable as it consists of an equal number of positive and negative items; but to date, research does not confirm her hypothesis. Research is warranted to determine if variability exists based on psychological sex-type.

Past research on speech communication apprehension revealed that females are more apprehensive than males on speech apprehension items while males are more apprehensive than females on listening apprehension items.[18] Research by McDowell and McDowell concluded that speech and listening apprehension differences exist between sexes and across educational levels.[19] Previous researchers, except Greenblatt, et al., have used biological sex to classify males and females. Their study did reveal that androgynous individuals were less apprehensive than other psychological sex-types. Their study used a univariate analysis and only speech apprehension scores. A multivariate analysis may provide a more reliable and valid indicator of differences based on psychological sex-types.

Previous research on androgynous subjects has ignored age (educational level) as an independent variable. Other research, based on biological sex, has produced contradictory results. Strong [20] indicated sex roles exist from adolescence to middle age, while Bennet and Cohen[21] reported overlap among college students. These differences may have occurred because bipolar unidimensional instruments were used and a moderate percentage of participants

were androgynous or undifferentiated. This study will identify both biological and psychological sex of participants at each educational level. Based on inductive analysis certain age groups may fall into certain psychological sex-role catagories. A greater percentage of participants at the junior high level may be sex-typed or undifferentiated than at the senior high or college level.

Findings of this phase of the research may support Piaget's theory of formal operations, the last phase of intellectual development.[22] During this phase adolescents will acquire new values which eventually come into balance near the end of adolescence. The adolescent focuses on weighing, classifying, and reevaluating different social points. Piaget described four developmental accomplishments:

1. The social world becomes an organic unit which has its laws and regulations and its divisions of social functions.
2. Egocentricity has been dissolved by a sense of "moral solidarity" which is consciously cultivated.
3. Personality development from now on depends upon an exchange of ideas by social inter-communication in place of simple mutual imitation.
4. A sense of equality supersedes submission to adult authority.

Piaget indicated that the transition period between child and adult is person bound, but that generally intellectual maturity occurs during late adolescence.

Because this study focuses on biological and psychological sex types at different age levels (educational levels), this research may support Piaget's theory. During pre-adolesence and mid-adolesence individuals are in a transitional period between child and adult, and social practices can be compared with no real intention of adopting permanently any specific behaviors. Upon completion of the composite analysis, Piaget's concept of intellectual and social development will be supported if junior and senior high students

fall primarily into the undifferentiated area, low scores in both masculine and feminine areas.

Research Questions

Based on the above reason the following research questions are proposed:

1. Are biological males or females more apt to be psychologically androgynous, masculine, feminine or undifferentiated at the junior high, senior high and college levels?

2. Across educational levels are males more apt to be androgynous, masculine, feminine, or undifferentiated than females?

3. What are the relationship between (1) demographic scores and (2) psychological sex scores and communication apprehension scores at the junior high, senior high, and college educational levels?

4. What differences exist between biological males and females across educational levels based on social desirability scores and communication apprehension scores?

5. What differences among psychological sex-role groups exist within and across educational levels based on social desirability scores and communication apprehension scores?

Procedures

The sample consisted of junior high school students (n = 157, 87 males and 70 females), senior high students (n = 154, 69 males and 85 females) and college students (n = 181, 80 males and 101 females) from midwestern schools. Subjects were administered the four part questionnaire during the fall quarter, 1977.

Instruments

The questionnaire consisted of (1) demographic information, (2) BEM Sex Role Inventory (BSRI), (3) Personal Report of Communication Apprehension (PRCA), and (4) Receiver Apprehension Test (RAT). A description of the instruments follows:

a. Demographic Information

Demographic items were taken from Daly's demographic instrument.[24] The items included age, sex, year in school, number of brothers, number of sisters, birth order, size of home town, size of high school graduating class, etc. (other items were asked but were not used in the data analysis). Daly developed the instrument based upon previous research, input from researchers and student generated variables.

b. BEM Sex-Role Instrument

The BSRI consists of 60 personality characteristics, 20 masculine items, 20 feminine items and 20 social desirability items. (See Table 1). Initially, Bem and her students selected 200 items that were masculine or feminine in tone, and 200 additional items were selected that seemed to be neither masculine or feminine in tone. Next the 400 adjectives were submitted to 100 judges, 50 males and 50 females. The judges used a 7 point scale to rate the items, ranging from 1 ("not at all desirable") to 7 ("extremely desirable"). An item qualified as masculine or feminine if it was rated by both males and females as significantly more desirable for a specific sex. Through this procedure, 20 items were selected for the Masculinity Scale and 20 were

selected for the Femininity Scale. An item qualified as socially desirable if it was rated as no more desirable for either sex by both male and female judges.

Next students were asked to rate each item from 1 to 7, 1 ("never true of me") and 7 ("always true of me"). Then scores were added for each of the three dimensions. Two different methods can be used to determine the psychological sex-type of subjects. In this study the median was used to determine whether a person was classified as androgynous, masculine, feminine, or undifferentiated.* The following operational definitions were used:

Androgynous = both masculine and feminine scores above the median
Feminine = feminine scores above the median
Masculine = masculine scores above the median
Undifferentiated = both scores below the median

Bem reports careful construction of the BSRI that indicates high internal consistency, discriminant validity and test-retest reliability.[25]

c. Personal Report of Communication

McCroskey's self-report instrument, was utilized in this study.[26] As indicated in Table 2, items focus on fear of social disapproval in public speaking and in dyadic and group communication situations. The items deal with the encoding process of the speaker. The public speaking items were developed from Paul version of Gilkinson's PRCS. The items that focus on dyadic and group communication were developed by McCroskey and graduate students. Factor analysis with varimax rotation revealed that 20 of the 76 items were unidimensional at each educational level. Because only three items were different across educational levels, the college form was used at all educational

*As yet the undifferentiated category has not been adequately clarified. The reasoning, however, appears to be that an individual must rate one of the lists of adjectives or a combination of both sets to be psychologically sex-typed.

levels. The PRCA is reliable and valid.

d. Receiver Apprehension Test

When Wheeless developed the Receiver Apprehension Test (RAT), he reworded forty-five items from the PRCA, PRCS and Test Anxiety Inventory which focused on fear of misinterpreting, decoding messages and psychologically adjusting to messages. Wheeless also utilized factor analysis with varimax rotation to determine unidimensional items. Twenty items, as reported in Table 3, were unidimensional. The items include listening to speakers present instructions, ideas and new information. watching television, and dyadic and group communication situations. The RAT is reliable and valid.[27]

Statistical Analysis

Canonical correlations and discriminant function analyses were completed on the data. Wimmer indicates that ultivariate analysis is superior to univariate analysis for four reasons:

> (1) the study of behavior and communication theoretically investigate the relationship between a single dependent variable and many independent variables; (2) several measures on one person are correlated by virtue of their common origin-examination of correlated variables independently ignores this fact and may alter results; (3) multivariate analysis can handle many variables simultaneously and thereby saves time and resources; and (4) investigations of clusters of variables adds to theory structure--univariate analysis slows the process of structure analysis.[28]

Through the statistical process of canonical correlational analysis the linear relationship between two sets of variables can be determined.

Discriminant analyses also were completed on the data. This statistical technique maximizes differences between groups on variables included as predictors. Discriminant weights are used to maximize separation, and when linearly combined they differentiate groups. A stepwise discriminant function analysis is employed in this study.[29] Initially, the best discriminating variable is selected. Next, a second variable is selected from the remaining

variables using criteria that would improve the multivariate F in combination with the first.* This same process is continued until all significant variables are selected. Bartlett's Chi Square Test also were computed. Through this process Cooly and Lohnes contend that the optimum discriminant function is that which maximizes the ratio of the among group sums of squares to the within group sums of squares.[30]

Results

Initially, frequency data is reported on numbers of psychological sex-role types at each educational level and on composite data analysis. The median ratings by junior high students are 95 for masculine items and 88 for feminine items, senior high students are 104 for masculine items and 95 for feminine, and college students are 107 for masculine items and 104 feminine items. The overall median items are 102 for masculine items and 96 for feminine items. The results revealed differences among educational levels in terms of percentage representing various psychological sex types. Females were more apt to be androgynous and males undifferentiated at each educational level. The composite analysis revealed that a greater percentage of students were androgynous at the college level than at the senior high or junior high levels, while a greater percentage of students were undifferentiated at the junior high and senior high levels (See Tables 4 and 5).

*Through this process we determine the greatest minimization of Wilk's lambda. SPSS indicates lambda is an inverse measure of the discriminating power in original variables which has not yet been removed by the discriminant function. This statistical procedure is equivalent to selecting the variable which will maximize the overall multivariate F ratio to determine differences between group centroids. A centroid is a multivariate group mean.

The next phase of the analysis involved an estimate of the number of significant linear relationships between (1) demographic variables and (2) psychological sex-role and communication apprehension variables. The results of the overall analysis revealed a canonical variate at .58 ($p < .001$) and indicated a linear relationship between the (1) demographic variable (age (.66) and education of parents (.68) and (2) psychological sex variables (masculine (.49) and feminine (.48). That is,older subjects have higher masculine and feminine scores. The data also revealed a negative correlation between (1) demographic information variables masculine and feminine variables and (2) PRCA variables. The Canonical variate for root 2 also produced a significant relationship (p .001). Positive correlation occurred between (1) age and (2) feminine and PRCA scores. Root 3 also revealed a signficant positive canonical variate (< .007). Linear relationships exist among age, number of brothers and RAT scores (See Table 6).

Table 7 presents the canonical correlation for junior high students. The first two roots were significant at the .001 level. Root 1 reflected a relationship between size of home town (-1.42),and PRCA scores (-.85) while root 2 revealed a correlation between age (-.61) and education of parents (-.30) and masculine scores (-.70).

The canonical variates for senior high data show significant canonical correlations of .84 and .59 (p. .001). Root 1 results indicated linear relationships between size of home town (-.113) and PRCA scores (-.56) masculine (-.32), social desirability (-.4). The findings for Root 2 showed relationships between age, education, masculine and social desirability scores. In addition a negative relationship existed between demographic variables and communication apprehension scores (See Table 8).

The college results revealed that only variate 1 is significant (p.< .001). The loadings showed a relationship between (1) demographic variables age (.21)

and brothers (.28) and (2) psychological and communication apprehension variables Masculine (.36), PRCA (.92) and RAT (.38). A high negative relationship existed between education of parents and other variables. (See Table 9).

Stepwise disciminant analyzes, including overall bilogical sex data, psychological sex data at the junior high, senior high and college levels and overall psychological sex data were completed.

The overall multivariate F was significant ($p < .001$) for the biological sex groups. (See Table 10). That is, the differences between males and females varied significantly across the dependent variables of social desirability, PRCA, and RAT scores. The Bartlett's Chi Square analysis revealed that only the first discriminant function (Listening) was significant ($p. < .001$).

The multivariate analysis for each educational level and overall data based on psychological sex also produced significant results ($P. < .001$). At the junior high level the chi square analysis revealed significant results for only the first disciminant function (See Table 11). The function was labeled Speech Apprehension. A wide variation existed among the centroids for the psychological sex-role groups. For secondary students the first two discriminant functions were signficant ($p. < .001$). The functions were labeled Social Desirability and Speech Apprehension (See Table 12).

At the college leveal all three discriminant functions were significant ($p. < .001$). The functions as reported in Table 13 were labeled Speech Apprehension ($p. < .001$), Social Desirability ($p. < .001$) and Listening Apprehension ($p. < .001$). Likewise, all discriminant functions were significant on the overall psychological data (See Table 5 for breakdown of data). Functions were labeled Speech Apprehension, Listening Apprehension and Social Desirability (See Table 14).

DISCUSSION

An interpretation of the results of this study indicated differences among psychological sex-role groups for educational levels and composite results. The inductive analysis revealed that approximately the same percentages of subjects from each educational level were categorized across psychological sex-role types. The composite analysis, using all data to determine group medians, revealed differences in terms of percentages of psychological sex-types at the three educational levels. As reported in the result section, college students were five times more likely to be androgynous than junior high students and two times more likely than senior high students. Junior high students, on the other hand, held a 4 to 1 ratio over college students and 2 to 1 over senior high students in the undifferentiated category. Other results revealed that biological sex was a key indicator of psychological sex type at the junior high and senior high level, but not at the college level.

The results of this phase of the research add support to Piaget's theory of formal operations. That is, during the first part of the adolescent period adherence to mutuality give way to social intercourse. In addition, during this developmental phase adherence to authority, primarily parents, is replaced by social integrity. Based on this theory, it appears that junior high students adhere to the stereotype biological sex roles or are in a transitional stage between adherence to parents and to peers, perhaps experiencing an identity crisis. Thus in their confused state the students do not rate positively the attributes of masculine and feminine characteristics.

The canonical correlational analysis was completed to determine linear relationships between (1) demographic information variables and (2) psychological sex and communication variables. The overall results pointed out that older participants had higher masculine and feminine scores, and thus it can be assumed would more likely be androgynous. These results showed a linear

relationship between demographic variables (age and education of parents) and psychological sex variables (masculine and feminine), but negative relationships between these variables and PRCA and RAT scores. The negative relationships indicated individuals with high psychological sex scores had lower apprehension scores.* The high positive relationships between age, feminine and PRCA scores add support to previous biological sex research by extending it to psychological sex research. That is, older psychologically feminine subjects are more likely to be high speech apprehensives.*

The results of the canonical variates for junior high and senior high subjects are difficult to explain based on previous research. The linear relationships between size of home town and speech apprehension does not make any conceptual sense. More demographic information concerning salient cognitive variables may uncover the reasons for these confusing results. The high positive correlations between age and PRCA add support to the hypothesis that speech apprehension increases with age.

The confusion, however, that exists in explaining the junior high and senior high results did not exist at the college level. High linear relationships existed between (1) demographic variables (age) and (2) psychological sex variables (masculine and feminine scores). Negative relationships existed between these variables and PRCA scores. This again supports previous biological sex research as speech communication apprehension scores increase with age. The high negative relationship between feminine scores (either male or female)and PRCA scores suggests that subjects with high PRCA scores are more apt to be apprehensive. Similar results, as reported above, also occurred on the overall data. The data analysis also revealed individuals from larger towns

*Prior to the study the researchers perceived this might occur, and thus decided to categorize subjects into psychological sex types to determine if androgynous subjects were less apprehensive. This information will be discussed when focusing on the stepwise discriminant analysis results.

were less apt to be apprehensive. Through data snopping it was revealed that subjects from larger towns had more speech experience.

Although canonical correlation coefficients is an excellent multivariate statistic to determine external relationships between two sets of variables, stepwise discriminant function analysis was necessary to test the androgynous construct. Initially, composite analysis across educational levels using biological sex as an independent variable was completed to determine if it supported previous stereotyped sex role research (males will be less apprehensive than females on speech items but more apprehensive on listening items). The results did not support the stereotyped research as females were not significantly more apprehensive on PRCA scores. Males, however, were significantly more apprehensive on the listening dimension.

Next, the stepwise discriminant function analysis was completed on psychological sex-role data at each educational level and across educational levels using the classification categories listed in Tables 4 and 5. The junior high analysis revealed large differences on group centroids among the four groups. Androgynous subjects had the lowest PRCA and RAT scores, but scored higher on the social desirability items than masculine and undifferentiated subjects. Androgynous subjects were less polarized in rating social desirable items, especially negative adjectives. For example, they were more apt to rate positively the adjective "unpredictable" than other sex groups. Feminine subjects, on the other hand, rated both positive and negative items positively. These results indicated that feminine subjects may have a negative self-concept--or that they do not perceive negative adjecture negatively. Masculine subjects viewed the positive adjective positively and the negative adjective negatively. Undifferentiated subjects rated mamy positive and negative ajectives in the undecided category. Thus, the junior high results definitely revealed differences among psychological sex groups.

For junior high subjects only the first discrimiant function, labeled PRCA, was significant. The large difference between group means indicated that androgynous and masculine subjects were considerably less apprehensive on PRCA scores. Feminine and undifferentiated subjects were similar on communication apprehension scores.

The analysis at the senior high level produced results similar to the junior high data. Like the junior high data, senior high data revealed that androgynous subjects had significantly lower PRCA scores and higher social desirability scores, except for the feminine group, than other groups. Unlike junior high results, two discriminant functions, labled Social Desirability and PRCA, were significant. The high Social Desirability scores point up that androgynous subjects' behaviors are more flexible (not viewing adjectives as either right or wrong). Androgynous subjects rated more adjectives as "sometimes true of me," "true of me," or "generally true of me," whereas other groups rated them at one of the bipolar ends.

The college data also produced a higher centroid for the androgynous group with all three discriminant functions being significant. Unlike previous educational level results, masculine subjects had lower PRCA scores than androgynous subjects. At all three educational levels feminine and undifferentiated subjects had higher PRCA and RAT scores. The college results also showed that less variability occurred among the means of groups on social desirability scores than at the junior high or college level. Thus, social desirability does not appear to be as important at the senior high level.

After completing the inductive analysis for each educational level, composite analysis using overall medians of masculine and feminine scores to categorize subjects into psychological sex groups was completed. This analysis revealed larger differences in group centroids than other analyses, and all three functions were significant at the .001 level. The composite results clearly

showed that androgynous subjects have higher social desirability scores and lower PRCA and RAT scores. It also revealed a greater difference between androgynous and masculine subjects, than the inductive analyses. In addition, when the composite biological sex results were compared with the psychological sex results, the psychological sex results revealed greater differences between groups on each dependent measure. All three discriminant functions were significant for psychological sex results whereas only the Listening Apprehension dimension was significant for biological sex results.

Finally, this study has show the advantages of using multivariate statistics. Through this procedure it has been demonstrated that psychological sex groups do exist, that there are extreme differences among sex groups on PRCA scores, that the distinction between groups increases from one educational level to another, and that PRCA and RAT scores are approximately the same at each educational level for the psychological sex-role groups.

FUTURE RESEARCH

Based on the results of this study, additional investigations are needed to better understand attitudes and behaviors of each psychological sex-role type. One study might focus on relationships between psychological sex-roles and communication variables. Because masculine and feminine scores are considerably lower at the junior high and senior high levels, it is necessary to develop criteria to classify subjects across all educational levels. As this study revealed using the inductive approach will place many masculine, feminine and undifferentiated subjects into the androgynous category. Thus to maximize between group variance standardized median scores are needed.

Another study might focus on understanding change that occurs from one educational level to another. To track this change longitudinal, panel studies might be completed. In this fashion researchers could determine at what age participants move from one psychological sex category to another. For example, at the junior high level a majority of students are in the undifferentiated category. If the BSRI were administered to the same subjects at the junior and senior high and college levels, investigators may discover that many undifferentiated subjects move from the undifferentiated to masculine, feminine or androgynous category. In addition, the panel study may reveal that students with certain demographic characteristics are more likely to move from the undifferentiated category to the androgynous category.

A third study might focus on communication behaviors of subjects of each psychological sex-role category at various educational levels. Through these studies communicologists might better understand the psychological sex-role construct.

FOOTNOTES

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Table 1

Items on the Masculinity, Femininity, and Social Desirability Scales of the BSRI

Masculine items	Feminine items	Neutral items
Acts as a leader	Affectionate	Adaptable
Aggressive	Cheerful	Conceited
Ambitious	Childlike	Conscientious
Analytical	Compassionate	Conventional
Assertive	Does not use harsh language	Friendly
Athletic	Eager to soothe hurt feelings	Happy
Competitive	Feminine	Helpful
Depends own beliefs	Flatterable	Inefficient
Dominant	Gentle	Jealous
Forceful	Gullible	Likable
Has leadership abilities	Loves children	Moody
Independent	Loyal	Reliable
Individualistic	Sensitive to the needs of others	Secretive
Makes decisions easily	Shy	Sincere
Masculine	Soft spoken	Solemn
Self reliant	Sympathetic	Tactful
Self-sufficient	Tender	Theatrical
Strong personality	Understanding	Truthful
Willing to take a stand	Warm	Unpredictable
Willing to take risks	Yielding	Unsystematic

Table 2

Personal Report of Communication Apprehension (PRCA)

The following statments apply to how various people feel about communicating with other people. Indicate the degree to which the statements apply to you by marking whether you (1) strongly agree, (2) agree, (3) undecided, (4) disagree, (5) strongly disagree with each statement. Work quickly, just record your first impression.

1. While participating in a conversation with a new acquaintance I feel very nervous.
2. I have no fear of facing an audience.
3. I look forward to expressing my opinion at meetings.
4. I look forward to an opportunity to speak in public.
5. I find the prospect of speaking mildly pleasant.
6. When communicating, my posture feels strained and unnatural.
7. I am tense and nervous while particiapting in a group discussion.
8. Although I talk fluently with friends I am at a loss for words on the platform.
9. My hands tremble when I try to handle objects on the platform.
10. I always avoid speaking in public if possible.
11. I feel that I am more fluent when talking to people than most other people are.
12. I am fearful and tense all the while I am speaking before a group of people.
13. My thoughts become confused and jumbled when I speak before an audience.
14. Although I am nervous just before getting up, I soon forget my fear and enjoy the experience.
15. Conversing with people who hold positions of authority causes me to be fearful and tense.
16. I dislike to use my body and voice expressively.
17. I feel relaxed and comfortable while speaking.
18. I feel self-conscious when I am called upon to answer a question or give an opinion in class.
19. I face the prospect of making a speech with complete confidence.
20. I would enjoy presenting a speech on local television.

Table 3

Receiver Apprehension Test (RAT)

The following statements apply to how various people feel about receiving communication. Indicate of these statements apply to how you feel by noting whether you (1) strongly agree, (2) agree, (3) undecided, (4) disagree, or (5) strongly disagree.

1. I feel comfortable when listening to others on the phone.
2. It is often difficult for me to concentrate on what others are saying.
3. When listening to members of the opposite sex I find it easy to concentrate on what is being said.
4. I have no fear of being a listener as a member of an audience.
5. I feel relaxed when listening to new ideas.
6. I would rather not have to listen to other people at all.
7. I am genarallly overexcited and rattled when others are speaking to me.
8. I often feel uncomfortable when listening to others.
9. My thoughts become confused and jumbled when reading important iformation.
10. I often have difficulty concentrating on what others are saying.
11. Receiving new information makes me feel restless.
12. Watching television makes me nervous.
13. When on a date I find myself tense and self-conscious when listening to my date.
14. I enjoy being a good listener.
15. I generally find it easy to concentrate on what is being said.
16. I seek out the opportunity to listen to new ideas.
17. I have difficulty concentrating on instructions others give me.
18. It is hard to listen or concentrate on what other people are saying unless I know them well.
19. I feel tense when listening as a member of a social gathering.
20. Television programs that attempt to change my mind about something make me nervous.

Table 4: Frequence Data and Percentages; Educational Level Results.

Educational Level	Androgynous No	Androgynous Per	Masculine No.	Masculine Per	Feminine No.	Feminine Per	Undifferentiated No.	Undifferentiated Per
Junior High Overall	44	28.03	38	24.21	32	20.48	43	27.39
Male	18	20.70	33	37.95	7	8.05	29	33.35
Female	26	37.18	5	7.15	25	35.75	14	20.02
Senior High Overall	49	31.85	27	17.55	32	20.80	44	28.60
Male	18	26.31	17	24.65	6	8.70	28	40.80
Female	31	38.13	10	12.30	26	31.98	18	21.07
College Overall	52	28.81	42	22.27	42	22.27	45	24.83
Male	18	22.50	21	26.25	18	22.50	23	28.75
Female	34	33.66	21	20.79	24	23.76	22	21.78

Medians for each educational level were used to determine psychological sex-role types.

Table 5: Frequence Data and Percentages: Overall Result.

Educational Level	Androgynous No.	Androgynous Per	Masculine No.	Masculine Per	Feminine No.	Feminine Per	Undifferentiated No.	Undifferentiated Per
Junior High								
Overall	17	10.88	45	28.80	22	14.08	73	46.72
Male	4	4.60	35	40.25	6	6.90	42	48.30
Female	13	18.59	10	14.30	16	22.88	31	44.33
Senior High								
Overall	44	28.60	34	22.10	27	15.15	49	31.85
Male	13	18.85	24	34.80	4	5.80	28	40.60
Female	31	36.27	10	11.70	23	26.91	21	24.57
College								
Overall	98	53.90	32	17.60	27	14.85	24	13.20
Male	40	50.00	15	18.75	14	17.50	11	13.75
Female	58	57.42	17	16.83	13	12.87	13	13.86

Composite medians were used to determine psychological sex-role types.

Table 6 : Canonical Correlation Analysis

Overall (N=492)

Variate	Eigenvalue	Canon/Corr.	Wilks Lambda	Chi Square	D.F.	Signif
1	.38	.62	.43	298.11	25	.001
2	.25	.50	.70	126.20	16	.001
3	.05	.23	.93	22.56	9	.007

Coefficient of the Left Set	canvar 1	canvar 2	canvar 3	Coefficient of the Right Set	canvar 1	canvar 2	canvar 3
Age	.66	.59	-.51	Masculine	.49	.22	.39
Brothers	.06	-.05	-.74	Feminine	.48	.88	-.27
Sisters	-.03	-.03	.08	Social Desires	-.07	-.81	.14
Education of Parents	.68	-.69	.11	PRCA	-.39	.74	.13
				RAT	-.25	-.21	-.98
Size of Town	-.04	.31	.69				

Table 7 : Canonical Correlation Analysis

Junior High Students (N=157)

Variate	Eigenvalue	Canon/Corr.	Wilks Lambda	Chi Square	D.F.	Signif
1	.69	.83	.12	265.67	25	.001
2	.57	.75	.40	114.33	16	.001

Coefficient of the Left Set			Coefficient of the Right Set		
	canvar 1	canvar 2		canvar 1	canvar 2
Age	.91	-.61	Masculine	-.08	-.70
Brothers	.03	-.10	Feminine	-.09	-.20
Sisters	.08	-.11	Social Desires	-.06	-.23
Education of Parents	.21	-.30	PRCA	-.85	-.26
Size of Town	-1.42	-.17	RAT	-.17	-.05

Table 8 : Canonical Correlation Analysis

Senior High School Students (N=154)

Variate	Eigen value	Canon/Corr.	Wilks Lambda	Chi Square	D.F.	Signif
1	.70	.84	.19	246.13	25	.001
2	.35	.59	.63	67.16	16	.001

	Coefficient of the Left Set canvar 1	canvar 2		Coefficient of the Right Set canvar 1	canvar 2
Age	-.007	-.33	Masculine	-.32	-.44
Brothers	.04	.09	Feminine	-.002	-.04
Sisters	.03	.01	Social Desires	-.41	-.37
Education of Parents	.48	-1.00	PRCA	-.56	.52
Size of Town	-1.13	.36	RAT	-.23	.23

Table 9 : Canonical Correlation Analysis

College Students (N=181)

Variate	Eigen value	Canon/Corr	Wilks Lambda	Chi Square	D.F.	Signif
1	.332	.576	.491	50.92	25	.002
2	.172	.415	.734	22.09	16	.140

Coefficient of the Left Set	canvar 1	canvar 2	Coefficient of the Right Set	canvar 1	canvar 2
Age	.21	-.10	Masculine	.36	.23
Brothers	.28	.96	Feminine	.12	.01
Sisters	.14	.31	Social Desires	.03	-.14
Education of Parents	.76	.36	PRCA	.92	-.54
Size of Town	-.00	.42	RAT	.38	.94

Table 10

Discriminant Data for Multivariate Comparison of Centroids: Overall

Means

	Social Desirability	PRCA	RAT
Females	94.77	58.43	41.49
Males	92.48	57.93	44.60

Standardized Discriminant Function Coefficient

1.6438	.5150	-.6334

Centroids

Females = 72.21

Males = 61.20

Bartlett Chi Square Test of Significance for Discriminant Function

Roots	X_2	df	P
1 Lis	20.18	3	.000

Table 11

Discriminant Data for Multivariate
Comparison of Centroids : Junior High

	Means		
	Social Desirability	PRCA	RAT
Androgynous	97.63	54.48	45.11
Masculine	91.71	55.82	47.51
Feminine	114.18	65.57	49.90
Undifferentiated	85.09	65.16	49.00

Standardized Discriminant Function Coefficient		
1.6537	.8135	.3237

Centroids	
Androgynous	102.55
Masculine	90.90
Feminine	119.35
Undifferentiated	71.85

Bartlett Chi Square Test of Significance for Discriminate Function

Roots		X_2	df	P
1	SD	35.61	9	.001
2		6.27	4	.180
3		1.03	1	.309

Table 12

Discriminant Data for Multivariate Comparisons of Centroids: Senior High

Means

	Social Desirability	PRCA	RAT
Androgynous	99.60	53.91	39.02
Masculine	93.82	56.14	40.96
Feminine	97.80	64.35	43.06
Undifferentiated	90.43	59.43	41.59

Standardized Discriminant Function Coefficient

1.6438	.6150	-.6334

Centroids

Androgynous	105.14
Masculine	93.76
Feminine	93.81
Undifferentiated	85.76

Bartlett Chi Square Test of Significance for Discriminant Function

Roots	X_2	df	P
1 SD	70.39	9	.001
2 PRCA	15.02	4	.005
3 RAT	1.10	1	.294

Table 13

Discriminant Data for Multivariate Comparison of Centroids: College

Means			
	Social Desirability	PRCA	RAT
Androgynous	96.04	51.50	38.34
Masculine	89.64	48.85	38.50
Feminine	95.21	62.14	39.19
Undifferentiated	89.27	59.04	43.11

Standardized Discriminant Function Coefficient		
1.373	.6888	.1316

Centroids	
Androgynous	91.35
Masculine	84.37
Feminine	82.76
Undifferentiated	76.24

Bartlett Chi Square Test of Significance for Discriminant Function

Roots	X_2	df	P
1 PRCA	97.34	9	.000
2 RAT	44.22	4	.001
3 SD	2.81	1	.094

Table 14

Discriminant Data for Multivariate Comparisons of Centroids : Composite

Means

	Social Desirability	PRCA	RAT
Androgynous	96.39	54.34	39.27
Masculine	92.90	54.11	43.27
Feminine	104.31	62.81	45.23
Undifferentiated	88.17	63.28	44.98

Standardized Discriminant Function Coefficient

1.5107	.47008	.8734

Centroids

Androgynous	85.82
Masculine	77.15
Feminine	81.33
Undifferentiated	63.23

Bartlett's Chi Square Test of Significance for Discriminant Function

Roots	X_2	df	P
1 PRCA	107.86	9	.001
2 RAT	28.51	4	.001
3 S.D.	7.58	1	.006